MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 3, 2021/2022 (2135)

JPAM0135 – ALGEBRA

(Foundation in Information Technology)

3 OCTOBER 2022

9:00 a.m. – 11:00 a.m.

(2 Hours)

INSTRUCTIONS TO STUDENTS:

1. This exam paper consists of 3 **pages** (including cover page) with 5 Questions only.
2. Attempt all the questions. All questions carry equal marks and the distribution of marks for each question is given.
3. Please write all your answers in the Answer Booklet provided. Show all relevant steps to obtain maximum marks.

Question 1 [10 marks]

(a) Simplify the following rational expression:

(i) $$\frac{\frac{x}{y}-\frac{y}{x}}{\frac{x}{y}+\frac{y}{x}}$$ [2 1/2 marks]

(ii) $$\frac{x^2-x-6}{2x^2+4x}\div\frac{x^2-9}{x^2+8x+15}$$ [2 1/2 marks]

(iii) $$\frac{\sqrt{27x^5y^{14}}}{\sqrt{9x^4y^6}}$$ [2 1/2 marks]

(b) Solve $\frac{2x+3}{5x}=1-\frac{x+2}{2x}$ [2 1/2 marks]

Question 2 [10 marks]

(a) Find the quotient and the remainder of $f(x)=3x^4-4x^3-6x^2+3x-46$ divided by $x+2$.

[5 marks]

(b) Solve $\left(x^2+2^2\right)^{2/3}+\frac{29}{5}x(x^2+4)^{-1/3}=0.$ [5 marks]

Question 3 [10 marks]

(a) Solve the equation: $\frac{2}{x-3}=-\frac{5}{x-4}+\frac{3}{(x-3)(x-4)}$ [5 marks]

(b) Solve the inequality of $\frac{3x+7}{(x-3)(x+4)}<-1$. [5 marks]

Continued...

Question 4 [10 marks]

(a) Solve $x\sqrt{4x-13}=\sqrt{x^2-12x}$ and verify the answer. [5 marks]

(b) Use the quadratic formula (ax^2+bx+c) to find the real solutions, if any, of the equation.

$$2x^2-7x+5=0$$ [5 marks]

Question 5 [10 marks]

(a) Solve $\frac{x^2}{(x-1)^2}=\frac{4x}{x-1}-4$ [3 marks]

(b) Simplify the given expression: $\left(\frac{(2xy^{-3})^2(x^{-4}y)^3}{(4x^{-1}y^3)^2}\right)^{-2}$ [3 marks]

(c) Solve the inequality, $\left|\frac{3x-2}{2}\right|+2\le 6$. [4 marks]

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